Effluent control for river water quality and pollution management:application of decision support system for ...

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ABSTRACT

Water is the basic for lives. Moreover, water resources are very important for development of nations. But nowadays, water pollutions of different scales happen everywhere as a result of improper effluent control. So, surface water is seriously affected. The management and control of pollution sources before discharged into river are mostly important to maintain water quality. In this study, the innovated concepts of Integrated Pollution Control (IPC) and Total Maximum Daily Loads (TMDLs) are discussed. The Decision Support System for Integrated Pollution Control (DSS/IPC) model is applied to meet the goals of proper river management. Analysis of a study case of water pollution situation in a city was carried out and demonstrated by using DSS/IPC and MapInfo systems. The study identifies and compares major pollution sources for surface water within the study area. The simulated results also show the most serious pollution source, such as textile manufacturing, which needs to be controlled and reduced. Calculation of water pollutants quantity (especially BOD5) discharged into rivers indicates that, half of rivers beyond the legislated standard of BOD5 in study area are identified to be polluted. To reduce BOD5 concentration in polluted rivers to meet legislated standard, the reduction measures of industrial processes must upgrade to secondary treatment. In addition, the results also estimate the total cost for upgrading and the Long Run Marginal Cost (LRMC). The highly BOD5 effluent charge is proposed to encourage factories to reduce quantities of BOD5.Finally, a successful combination between the DSS/IPC and MapInfo, series of pollution maps and database were created for environmental managers, such as background pollution,river pollution,and serious sources pollution maps etc. Those maps will be easier to share and open all the information to concerned public and stakehold- ers.

Keywords : Effluent control,Water quality, Decision support system for integrated pollution control(DSS/IPC)

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